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Matthew R. Schantz Woodard, Emhardt, Naughton, Moriarty and McNett Bank One Center/Tower 111 Monument Circle, Suite 3700 Indianapolis, IN 46204-5137				EXAMINER SHARON, AYAL I
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/884,528

Filing Date: June 19, 2001

Appellant(s): WASYNCZUK ET AL.

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Troy J. Cole  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 5/29/07 appealing from the Office action  
mailed 12/05/06.

**(1) Real Party in Interest**

The real party in interest in this appeal is P.C. Krause and Associates, Inc., which is the owner of the present application by written assignment recorded at reel/frame number 011918/0748.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

**All claim rejections under 35 U.S.C. 103(a).**

Examiner has withdrawn the rejections in light of Appellant's evidence of commercial success.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. **Claims 1-13, 16-20, and 24-26, 29-42 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**
3. The claims lack a concrete, tangible, and useful result.
4. An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result.
5. One may not patent every "substantial practical application" of an idea, law of nature or natural phenomena because such a patent "in practical effect be a

patent on the [idea, law of nature or natural phenomena] itself." Gottschalk v.

Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972).

6. Moreover, whether a claim recites a machine implemented process is not determinative of whether that process claim is statutory. Thus, a claim that is nothing more than a machine-implemented abstract idea is not statutory. See Benson, 409 U.S. 63, 175 USPQ 673 (finding machine-implemented method of converting binary-coded decimal numbers into pure binary numbers unpatentable).
7. The fundamental test for patent eligibility is to determine whether the claimed invention produces a "**useful, concrete and tangible result.**" See State Street Bank & Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999). In these decisions, the court found that the claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result."
8. See State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. ("[T]he transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result' – a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades").

9. See also AT&T, 172 F.3d at 1358, 50 USPQ2d at 1452 (Claims drawn to a long-distance telephone billing process containing mathematical algorithms were held to be patentable subject matter because the process used the algorithm to produce a useful, concrete, tangible result without preempting other uses of the mathematical principle).

**(10) Response to Argument**

**35 U.S.C. § 101 Rejections**

The Examiner respectfully disagrees with the Appellant in finding that all of the claims in the application are invalid under 35 U.S.C. § 101.

As stated in the Final Rejection dated 12/5/06 (see ¶ 14), one may not patent every “substantial practical application” of an idea, law of nature or natural phenomena because such a patent “in practical effect be a patent on the [idea, law of nature or natural phenomena] itself.” Gottschalk v. Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972).

The claims in Gottschalk were directed to a mathematical method running on a computer: converting binary-coded-decimal (BCD) numerals into pure binary numerals for use with general purpose digital computer of any type.

Gottschalk at 65.

The Supreme Court held in Gottschalk that “one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in

connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." Gottshcalk at 71-72.

Therefore, whether a claim recites a machine implemented process is not determinative of whether that process claim is statutory. Thus, a claim that is nothing more than a machine-implemented abstract idea is invalid.

Moreover, the Supreme Court also held that "[h]ere the 'process' claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may (1) vary from the operation of a train[,] to verification of drivers' licenses[,] to researching the law books for precedents[;] and (2) be performed through any existing machinery or future-devised machinery or without any apparatus." Gottshcalk at 68.

The Examiner finds that the claims in the instant application share the same characteristics as the claims in Gottshcalk. The claims in the instant application are directed to a machine-implemented abstract idea. These claims are: (1) so abstract and sweeping as to cover both known and unknown uses of the underlying math, (2) so abstract and sweeping as to be applicable to a wide variety of unrelated applications.

For example, independent claim 1 recites "implement[ing] a first continuous-time model to simulate a first physical subsystem", "send[ing] a first series of state-related numerical values", "receiv[ing] said first series of state-related numerical values", "implementing a second continuous-time model to

simulate a second physical subsystem ... taking as an input values from said first series of state-related numerical values", and "output[ting] data representative of a state of the second continuous-time model."

Claim 1 does not limit the terms "continuous-time model", "physical subsystem", or "state variable" in any substantive way, aside from limiting the "first series of state-related numerical values" to "reflecting information relating to the value of the first state variable at a different point  $t_m$  in simulation time in the first model."

Therefore, the claim covers a very wide range of unrelated applications that "simulate" physical subsystems in continuous-time models. The "physical subsystems" can refer to turbine engines and "electrical subsystems" (as taught in p.1, col.1 of Appellant's Exhibit D attached to the Appeal Brief), or they can refer to "thermal avionics, sensor, and directed energy subsystems" (as taught in p.1, col.3 of Appellant's Exhibit E attached to the Appeal Brief). While the Appellant's exhibits are limited to "physical subsystems" in airplanes, the claims are not limited as such. The claims cover any physical item containing subsystems. In other words, the claims are so broad as to cover every "substantial practical application" as discussed in Gottschalk.

In response to the Examiner's rejections, the Appellant cites to the Court of Appeals for the Federal Circuit (CAFC) decision in State Street Bank & Trust Co. v. Signature Financial Group Inc., 149 F.3d 1368 (Fed. Cir. 1998) (upholding a claim to a computer-calculated price for one share of a mutual fund). The

Examiner notes that State Street was decided by a lower court, and therefore does not overrule the Supreme Court decision in Gottschalk.

Moreover, the Examiner interprets the State Street decision differently than the Appellant does. The Appellant interprets State Street as upholding claims that “model a real world thing”, “use mathematical operations to determine some aspect of that real world thing”, and then “output this descriptive aspect.”

The Examiner reads the case very differently. The Examiner interprets the holding in State Street to be narrow in scope: that a dollar value output is a “concrete, useful, tangible” result. The decision says so expressly (See State Street at 1373. Emphasis added):

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces “a useful, concrete and tangible result”- a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

The Examiner notes that the CAFC has upheld other computer-implemented algorithm claims, where the outputs were narrowly claimed. AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed. Cir. 1999) (upholding claims directed to a long-distance telephone billing process containing mathematical algorithms that generated PIC codes); In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994) (upholding claims directed to computer-implemented mathematical algorithms that generated smooth waveform display on a rasterized monitor); Arrhythmia Research Technology Inc. v. Corazonix Corp., 958 F.2d 1053, 22 USPQ2d 1033

(Fed.Cir.1992) (upholding claims directed to the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations that output the condition of a patient's heart).

The common link between those cases was a test to determine whether the claimed invention produces a **"useful, concrete and tangible result."** State Street at 1373. In comparison, independent claim 1 in the instant application recites "output[ting] data representative of a state of the second continuous-time model." Examiner finds that the "representative of a state of [a] second continuous-time model" falls under the Gottschalk definition of a claim that "is so abstract and sweeping as to cover both known and unknown uses." Examiner also respectfully disagrees with the Appellant in regards to the applicability of State Street. Examiner finds that "data representing the state of a computer-simulated physical subsystem" is far to broad to constitute a "useful, concrete and tangible result."

Examiner finds that all of the claims in the instant application share this defect.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer. For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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